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RESEARCH LAB WRIGHT-PATTERSON AFB.. H K HILLE SEP 82
UNCLASSIFIED AMRL-TR-75-50-VOL-157 F/G 1/2 NL

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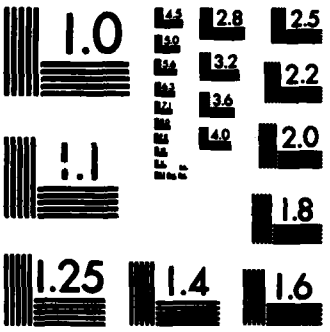

AMRL-TR-75-50
Volume 157

(12)

USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

Volume 157

KC-10A IN-FLIGHT CREW NOISE

SEPTEMBER 1982

AIR FORCE AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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AMRL-TR-75-50, Vol. 157

This report has been reviewed by the Office of Public Affairs (PA) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER

HENNING E. VON GIERKE, Dr Ing
Director
Biodynamics and Bioengineering Division
Air Force Aerospace Medical Research Laboratory

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The KC-10A is the standard USAF tanker-transport aircraft with high-speed high-altitude refueling and long range transport capability. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this helicopter during normal flight operations. Data are reported for 24 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise levels,

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and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application," AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Air Force Aerospace Medical Research Laboratory, under Project/Task 723109, Communication and Performance Capability and Operational Noises. The author acknowledges the efforts of Mr. John Cole who established the data analysis requirements, Mr. Henry Mohlman, and Mr. Fred Lampley of the University of Dayton who assisted in the mechanics of data processing and Mrs. Norma Peachey who typed this report and prepared it for publication.

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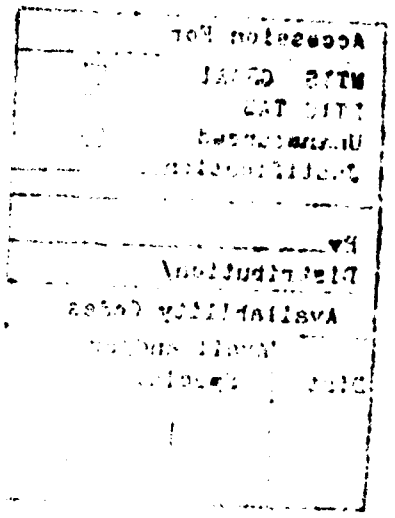

INTRODUCTION

The KC-10A is a USAF tanker-transport aircraft with high-speed high-altitude refueling and long range transport capability. This aircraft, which is manufactured by the McDonnell Douglas Corporation, is powered by three CF-6-50C1 turbofan engines each rated at 52,500 lbs. maximum takeoff thrust. The engines are manufactured by the General Electric Company, Aircraft Engine Group.

This volume provides measured and extrapolated data defining bioacoustic environments produced inside this helicopter. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the KC-10A aircraft.

This volume is one of a series published by the Air Force Aerospace Medical Research Laboratory (AFAMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during ground operations of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, Refer to Volume 1 (reference 1) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published.

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1. Cole, John N., USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application, AMRL-TR-75-50(1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

IN-FLIGHT NOISE

MEASUREMENTS

All noise measurements were made on-board a standard-configured KC-10A aircraft during typical speed, altitude, and flight maneuver conditions. These levels describe the standard KC-10A environments, but may not be representative of those levels encountered if the aircraft has been configured differently (e.g., major equipment or structural changes).

Acoustic measurements were made at various flight crew and passenger locations. Table 1 lists the measurement locations and test conditions as numeric/alphabetic designators which are used on the data pages. The designator 1/A means measurement location 1 and test condition A.

The microphone position was at ear level external to headgear in a region 0.2-0.3 meter from the head when an individual was present. At unoccupied locations, measurements were made at ear level throughout a volume where the head would normally be located. In both cases, the microphone was randomly moved throughout a spherical volume approximately 0.3 meter in diameter and the resultant samples analyzed using a 4- or 8- second integration time to obtain a power-averaged level, which effectively smooths out short-duration fluctuations and best describes the exposure.

Although the presence of a crew member or passenger at a measurement location affects the resultant sound field, the magnitude of such effects is generally small and not significant in determining exposure limits or voice communication capabilities. Consequently, no distinction is made in this report between occupied and unoccupied measurement locations.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced inside the KC-10A aircraft at the 24 specified locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data, C-weighted and A-weighted sound levels, maximum permissible time for one exposure per day (AFR 161-35) with and without standard Air Force ear protectors, preferred speech interference level, and perceived noise level are calculated and presented in Table 3. These measures are widely used to assess the effects of noise on personnel and their performance.

TABLE 1

MEASUREMENT LOCATIONS AND TEST CONDITIONS

KC-10A, Barksdale AFB, 21 June 1982

LOCATION	POSITION	HEIGHT ABOVE DECK
1	Cockpit Between Pilot & Copilot	Seated Head Level
2	Cockpit Navigator/Flight Engineer	Seated Head Level
3	Station 480, Seat at Right Sidewall	40″ Above Deck
4	Station 480, Seat at Centerline	40″ Above Deck
5	Station 480, Seat at Left Sidewall	40″ Above Deck
6	Top Bunk, Right Side, Curtain Closed	40″ Above Deck
7	Top Bunk, Left Side, Curtain Closed	40″ Above Deck
8	Bottom Bunk, Left Side, Curtain Closed	40″ Above Deck
9	Bottom Bunk, Left Side, Curtain Closed	40″ Above Deck
10	Station 1238, Centerline	40″ Above Deck
11	Station 1238, Left Sidewall	40″ Above Deck
12	Station 1238, Right Sidewall	40″ Above Deck
13	Station 1538, Right Sidewall	40″ Above Deck
14	Station 1538, Centerline	40″ Above Deck
15	Station 1538, Left Sidewall	40″ Above Deck
16	Station 1738, Left Sidewall	40″ Above Deck
17	Station 1738, Centerline	40″ Above Deck
18	Station 1738, Right Sidewall	40″ Above Deck
19	Boom Operating Area, Middle Seat	Seated Head Level
20	Boom Operating Area, Pumps On, Middle Seat	Seated Head Level
21	Boom Operating Area, Pumps On, Left Seat	Seated Head Level
22	Boom Operating Area, Pumps On, Right Seat	Seated Head Level
23	Boom Operating Area, Retracting Boom, Doors Open	Seated Head Level
24	Boom Operating Area, Doors Closed	Seated Head Level

CONDITION	DESCRIPTION
A	Engine Start
B	Taxi
C	All Engines Idle, Ground Runup
D	Takeoff/Roll
E	Climb to 5,000 ft.
F	Climb to 10,000 ft.
G	Climb to 20,000 ft. - 320 KIAS
H	Cruise - 37,000 ft. 0.8M AC - Automatic Mode With Both Pads Set on Auto
I	Cruise - 29,000 ft. - 325 KIAS Approach KC-135, Light Door Closed
J	Cruise - 29,000 ft. - Receiving Fuel From KC-135
K	Cruise - 29,000 ft. - 325 KIAS Approach KC-135, Light Door Open
L	Descent to 20,000 ft. - 320 KIAS
M	Approach - 3,000 ft. - 150 KIAS
N	Final Approach - 1,000 ft., Gear Down
P	Landing/Roll

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 01
02 AUG 82
PAGE F1

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/A	1/B	1/C	1/D	1/E	1/F	1/G	1/H	2/H	3/H	4/H	5/H	6/H	7/H	8/H
25	67	79	78	94	87	83	83	83	81	72	70	72	71	72	72
31.5	64	72	71	87	79	78	78	75	76	78	72	78	77	77	77
40	65	73	72	88	79	80	79	78	78	77	73	75	75	76	75
50	63	71	70	86	78	77	76	77	77	77	68	75	73	75	78
63	63	68	67	88	74	74	76	74	72	73	67	70	73	75	75
80	64	69	68	85	76	84	77	77	77	72	69	73	73	76	78
100	62	71	71	84	75	80	79	78	75	72	71	72	74	74	75
125	62	68	67	81	72	73	74	74	69	71	72	73	72	73	75
160	64	68	68	83	69	69	68	67	67	70	69	68	67	68	72
200	62	68	68	79	68	67	66	63	62	69	67	68	65	67	69
250	56	65	65	75	71	68	68	65	65	67	68	66	67	67	68
315	54	60	59	72	66	67	67	65	65	67	67	67	67	67	68
400	58	63	62	70	65	67	68	67	68	66	69	67	65	68	67
500	53	58	57	69	65	69	69	69	73	67	71	68	65	67	67
630	55	60	60	70	64	69	70	67	65	69	74	70	68	70	70
800	61	66	65	69	64	71	71	69	68	71	72	71	68	73	71
1000	55	61	61	67	63	67	69	65	65	69	68	69	65	69	69
1250	54	61	60	68	64	69	70	65	67	68	69	69	65	67	68
1600	54	61	61	67	63	66	68	64	63	67	68	68	63	66	65
2000	55	58	58	64	61	63	67	62	61	67	70	69	62	64	63
2500	53	58	57	61	60	59	63	58	58	62	64	63	58	60	58
3150	50	55	54	61	59	58	60	56	55	59	63	60	54	55	55
4000	49	56	55	61	60	55	57	53	52	55	58	57	51	52	54
5000	45	51	50	57	57	53	55	49	49	51	53	54	48	48	54
6300	42	48	47	54	55	52	54	48	47	50	54	55	46	47	58
8000	42	46	45	53	58	51	54	47	47	52	57	59	47	48	58
10000	41	43	42	53	57	48	55	45	45	51	56	58	46	48	57
OVERALL	75	83	82	98	89	89	88	87	86	85	83	85	84	85	86

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 02

02 AUG 82

PAGE F2

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

LOCATION/CONDITION

FREQ (HZ)	9/H	10/H	11/H	12/H	13/H	14/H	15/H	16/H	17/H	18/H	19/H	20/H	21/H	22/H	23/H
25	73	73	78	79	77	70	76	77	72	76	74	74	73	73	79
31.5	77	74	84	85	80	72	78	82	73	83	78	78	72	73	84
40	77	73	84	84	83	73	83	87	72	87	75	78	76	76	79
50	77	76	80	80	80	81	83	83	81	83	78	77	79	77	79
63	73	78	78	78	79	80	83	81	83	83	74	80	79	82	79
80	76	76	77	76	80	78	81	82	82	83	73	77	78	79	76
100	74	76	75	76	80	81	81	84	85	86	75	78	79	80	77
125	75	77	76	76	79	80	81	85	85	85	79	82	80	80	83
160	70	79	79	79	80	81	82	85	82	85	77	79	79	80	82
200	67	79	77	79	80	81	81	85	83	84	77	79	80	81	82
250	66	79	80	79	80	80	81	82	81	83	76	78	79	79	80
315	66	77	79	80	81	80	83	83	80	84	75	75	77	77	78
400	66	77	78	79	80	79	80	80	78	81	73	80	81	83	78
500	65	76	76	76	77	76	78	78	77	78	71	72	75	76	76
630	67	78	78	78	80	79	80	81	79	81	72	72	78	73	75
800	68	78	79	78	79	79	79	79	79	80	70	79	79	80	72
1000	66	75	75	75	76	76	76	76	76	77	67	69	70	70	69
1250	65	72	73	72	73	72	73	74	73	75	65	67	70	67	68
1600	63	69	69	69	69	68	69	70	69	70	62	66	70	66	64
2000	62	66	66	67	64	63	64	65	64	65	63	65	67	63	63
2500	57	62	62	62	59	58	59	59	59	59	59	64	67	62	62
3150	53	58	59	59	56	55	56	57	56	56	58	62	68	62	61
4000	52	56	56	56	53	53	53	53	53	53	56	57	60	56	59
5000	49	53	53	53	51	50	50	50	50	50	55	54	58	53	59
6300	46	50	51	51	49	48	48	48	48	48	51	52	56	51	60
8000	47	52	52	52	50	49	49	49	49	49	52	51	52	51	60
10000	45	51	51	52	49	48	48	48	48	48	50	51	50	51	61
OVERALL	85	89	92	92	92	91	93	95	93	96	87	90	90	91	92

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) 1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 03
02 AUG 82
PAGE F3

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 24/H	1/I	1/J	1/K	1/L	1/M	1/N	1/O	1/P
25	75	82	80	86	87	90	85	85	83
31.5	78	77	75	78	77	83	82	78	80
40	75	80	76	80	79	82	80	77	79
50	79	77	76	78	75	82	78	73	78
63	77	76	75	77	73	78	76	67	75
80	76	78	74	80	77	80	78	66	74
100	76	78	76	80	78	79	79	66	73
125	80	81	83	84	73	78	76	64	73
160	80	83	82	84	66	74	73	61	71
200	81	73	79	81	67	71	71	56	67
250	79	69	77	80	66	71	69	57	64
315	78	70	77	78	65	68	68	57	61
400	77	68	77	77	68	68	65	62	59
500	75	69	77	76	69	66	63	69	58
630	76	70	77	78	68	68	65	67	62
800	72	75	74	77	70	70	69	58	59
1000	68	70	72	76	68	67	65	54	55
1250	67	70	72	75	68	67	65	55	56
1600	67	67	71	73	65	65	62	56	57
2000	65	62	68	71	63	62	60	54	55
2500	62	59	65	69	59	59	56	51	56
3150	60	57	62	64	56	55	54	55	53
4000	56	57	57	60	53	52	52	47	51
5000	54	51	54	56	51	49	49	40	45
6300	52	50	52	54	50	50	47	41	43
8000	52	50	53	54	48	47	46	40	42
10000	51	48	52	53	46	45	44	40	42
OVERALL	90	90	90	93	89	93	90	87	87

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 — MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 01
02 AUG 82
PAGE J1

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/A	1/B	1/C	1/D	1/E	1/F	1/G	1/H	2/H	3/H	4/H	5/H	6/H	7/H	8/H
31.5	70	80	80	96	88	85	85	85	84	81	76	80	80	80	80
63	68	74	73	91	81	85	81	81	80	79	73	78	78	80	82
125	67	74	73	87	77	81	80	80	76	75	75	76	76	77	79
250	63	70	70	81	73	72	72	69	69	72	72	72	71	72	73
500	60	65	65	74	69	73	74	72	75	72	76	73	71	73	73
1000	63	68	67	73	68	74	75	72	71	74	74	74	71	75	74
2000	59	64	63	69	66	68	71	67	66	71	73	72	66	68	68
4000	53	59	58	64	63	60	62	58	57	61	64	62	56	57	59
8000	46	51	50	58	62	55	59	51	51	56	61	62	51	52	63
OVERALL	75	83	82	98	89	89	88	87	86	85	83	85	84	85	86

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 02
02 AUG 82
PAGE J2

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 9/H	10/H	11/H	12/H	13/H	14/H	15/H	16/H	17/H	18/H	19/H	20/H	21/H	22/H	23/H
31.5	81	78	88	88	85	76	85	88	77	88	81	82	79	79	86
63	81	82	83	83	84	84	87	87	87	88	80	83	83	84	83
125	78	82	82	82	85	85	86	89	89	90	82	85	84	85	86
250	71	83	83	84	85	85	86	88	86	89	81	82	83	84	85
500	71	81	82	82	84	83	84	84	83	85	77	81	83	84	81
1000	71	80	81	81	81	81	81	82	81	82	73	80	80	81	75
2000	66	71	71	72	70	69	70	71	70	71	66	70	73	69	68
4000	56	61	61	62	59	58	58	59	58	58	61	64	69	63	65
8000	51	56	56	56	54	53	53	53	53	53	56	56	58	56	65
OVERALL	85	89	92	92	92	91	93	95	93	96	87	90	90	91	92

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 03
02 AUG 82
PAGE J3

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 24/H	1/I	1/J	1/K	1/L	1/M	1/N	1/O	1/P
31.5	81	84	82	87	88	91	38	86	86
63	82	82	80	83	80	85	82	74	81
125	84	86	86	88	79	82	81	69	77
250	84	76	82	85	71	75	74	61	69
500	81	74	81	82	73	72	69	71	65
1000	74	77	77	81	73	73	71	61	62
2000	70	68	73	76	68	67	65	59	61
4000	62	60	63	66	58	57	57	56	56
8000	56	54	57	58	53	52	51	45	47
OVERALL	90	90	90	93	89	93	90	87	87

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST SR-082-001
RUN 01
02 AUG 82
PAGE H1

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

	LOCATION/CONDITION													
	1/A	1/B	1/C	1/D	1/E	1/F	1/G	1/H	2/H	3/H	4/H	5/H	6/H	7/H	8/H
HAZARD/PROTECTION															
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR															
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR															
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)															
NO PROTECTION															
OASLC	73	81	80	95	87	88	86	85	85	84	82	83	83	84	85
OASLA	66	71	71	79	74	77	78	75	75	77	79	78	74	77	77
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
H-157 IN-FLIGHT COMMUNICATION UNIT															
OASLA*	50	56	56	70	60	64	62	61	60	59	59	59	59	60	62
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION															
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)															
PSIL	61	66	65	72	68	72	73	70	71	72	74	73	69	72	72
ANNOYANCE															
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)															
TONE CORRECTION (C IN DB)															
PNLT	80	86	85	95	89	91	91	89	90	90	93	92	86	90	89
C	2	1	2	1	1	1	1	1	2	0	1	1	0	1	0

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: 3 MEASURES OF HUMAN NOISE EXPOSURE

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 02
02 AUG 82
PAGE H2

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

	LOCATION/CONDITION														
	9/H	10/H	11/H	12/H	13/H	14/H	15/H	16/H	17/H	18/H	19/H	20/H	21/H	22/H	23/H
HAZARD/PROTECTION															
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR															
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR															
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)															
NO PROTECTION															
OASLC	84	89	91	91	91	91	92	94	93	95	87	90	90	91	91
OASLA	74	83	84	84	85	84	85	86	85	87	78	82	84	84	82
T	960	571	480	480	404	480	404	339	404	285	960	679	480	480	679
H-157 IN-FLIGHT COMMUNICATION UNIT															
OASLA*	60	67	68	68	69	69	70	72	71	73	65	68	68	69	69
T	960	960	960	960	960	960	960	960	960	960	960	960	960	960	960
COMMUNICATION															
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)															
PSIL	69	78	78	78	78	78	79	79	78	80	72	77	79	78	74
ANNOYANCE															
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)															
TONE CORRECTION (C IN DB)															
PNLT	87	94	95	95	96	95	97	98	96	98	91	98	98	99	96
C	1	0	0	0	0	0	0	0	0	0	0	3	2	3	1

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

IDENTIFICATION:
OMEGA 3.2
TEST BR-082-001
RUN 03
02 AUG 82
PAGE H3

NOISE SOURCE/SUBJECT:
KC-10A IN-FLIGHT
CREW NOISE

OPERATION:

	LOCATION/CONDITION								
	24/H	1/I	1/J	1/K	1/L	1/M	1/N	1/O	1/P
HAZARD/PROTECTION									
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR									
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR									
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)									
NO PROTECTION									
OASLC	89	89	90	92	87	90	87	83	85
OASLA	81	79	83	85	76	76	74	70	69
T	807	960	571	404	960	960	960	960	960
H-157 IN-FLIGHT COMMUNICATION UNIT									
OASLA*	68	66	68	70	61	64	62	53	59
T	960	960	960	960	960	960	960	960	960
COMMUNICATION									
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)									
PSIL	75	73	77	80	71	71	68	64	62
ANNOYANCE									
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)									
TONE CORRECTION (C IN DB)									
PNLT	94	94	95	97	89	89	89	84	84
C	0	2	1	0	1	0	1	2	1

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.